abundantly confirmed in practice, and for which laws I am not responsible. Mr. Bilgram sets himself above, and defies the laws of nature in saying that "The alleged pressure resulting from impact is simply another instance of the anomalies at which theorists arrive." The "theorist" in this case is the Creator of the universe, who has established these laws, and to whom I refer Mr. Bilgram for redress of his grievances. It is not my fault that these laws do not agree with Mr. Bilgram's notions of what they ought to be. Mr. Bilgram says that "the principal factor in the phenomenon is friction of water in the pipe." Mr. Bilgram is in error about the friction being the principal factor in the phenomenon. Under the very high pressure in a hydrostatic test, the friction is of no importance.

JOHN W. NYSTROM.

PHILADELPHIA, October 18, 1884.

OBITUARY.

ROBERT EMPIE ROGERS.

Robert Empie Rogers, the subject of this sketch, was the son of the late Dr. Patrick K. Rogers, of Philadelphia, and was born, in the year 1814, in the city of Baltimore. He was one of a notable brotherhood, all now deceased, who were distinguished for their scientific attainments. His eldest brother, James B. Rogers, successively occupied the chair of Professor of Chemistry in the Washington Medical College at Baltimore, the Medical College of Cincinnati and the University of Pennsylvania. Henry D. Rogers, another brother, was a noted geologist, best known, perhaps, by his great work on the Geology of Pennsylvania. William B. Rogers, still another brother, whose death occurred two years ago, was the President of the Massachusetts Institute of Technology.

Robert E. Rogers was educated at the University of Pennsylvania, and, after his graduation, turned his attention especially to the study of chemistry and toxicology, as the assistant of Prof. Robert Hare. The earliest scientific work in which he was engaged was in connection with the Geological Survey of Pennsylvania (conducted by his brother, Henry D. Rogers), on the official staff of which he served as chemist in the campaigns of 1837 and 1838. In 1844 he was elected to the chair of Chemistry in the University of Virginia, from which he withdrew in 1852 to occupy the same chair in the Medical Department of the University of Pennsylvania, made vacant by the death of his brother James. Dr. Rogers held this post for twenty-five years, during a considerable portion of which he was the dean of the faculty.

In May, 1877 he resigned his position in the University of Pennsylvania to accept the chair of Medical Chemistry and Toxicology in the Jefferson Medical College, a position which he continued to occupy to within a few weeks of his death.

Dr. Rogers' connection with the Franklin Institute began in 1852, in

which year he was elected a member, and this association, which was most active, useful and honorable, continued uninterruptedly until terminated by his death. In 1555 he became a life member. In 1857 he was elected to the Board of Managers, in which he served until the following year, when he was chosen Vice-President. This office he occupied continuously for a period of eighteen years, and in the year 1875 was elected to the highest office in the gift of the Institute, that of President. This post of honor he filled for four years, from 1875 to 1878 inclusive. In 1879, declining a re-election, he was again elected to the Board of Managers, of which he was a member at the time of his death.

During most of the thirty-three years of his connection with the Institute, Dr. Rogers was prominently identified with its work. He was for many years an active member of the Committee on Instruction, and delivered several courses of lectures before the Institute on chemistry, electricity and kindred subjects.

He served also upon numerous special committees, the most notable of which were that engaged in the tests of the efficiency of dynamo-electric machines and the committee to investigate the dangers of electric lighting. Of both these committees he was the chairman, and the results of their work, which are recorded in the JOURNAL, were highly creditable. The investigation of the comparative efficiency of the dynamo-electric machine, indeed, was the first that had been made, and the work of the committee has a permanent value.

As a teacher and lecturer, Dr. Rogers had eminent qualifications. He had thorough command of his knowledge, and could easily and quickly avail himself of it. He was a fluent and eloquent speaker, and by the dignity and impressiveness of his manner, the elegance of his diction, his clearness of statement and his admirable skill as an experimentalist, he enjoyed a rare degree of popularity. The announcement that he was to lecture was sufficient to crowd the lecture-room of the Institute to the limit of its capacity, and many, doubtless, who read this tribute to his memory, will recall with pleasure the interest and enthusiasm which his presentation of a subject was sure to excite.

Dr. Rogers was a mechanic of no mean attainments, and made a number of inventions, the most notable of which, perhaps, is the form of steam generator known as the "Rogers & Black Boiler."

He was the author of a number of medical treatises, and contributed many papers on medical subjects to the scientific journals. His most recent literary work was the editing of an American reprint of Lehman's Physiological Chemistry.

In his intercourse with others, Dr. Rogers was distinguished by an unvarying affability and courtesy of manner; and they who enjoyed his friendship and intimacy, will cherish his memory as that of a most amiable, genial and accomplished gentleman.

At the time of his death, which occurred on the 6th of September, 1884, Dr. Rogers was in his 71st year.

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